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MARSHALL STAR

In This Week's Star ⊟

Marshall Team Remembers the First Man Who Walked on the Moon

The Marshall Space Flight Center team came together Sept. 14 to honor and remember the life of the first man who walked on the moon -- former astronaut Neil Armstrong. Armstrong's authorized biographer Dr. James R. Hansen, at right, brings many in the workforce to tears as he shares his close relationship with the American hero. Hansen, a professor of history at Auburn University in Auburn, Ala., is author of "First Man: The Life of Neil Armstrong," published in 2005.

In recounting his conversations with Armstrong, who died Aug. 25 at the age of 82, Hansen told his Marshall audience, "I thought it was important to explain that Armstrong possessed what I call 'the real right stuff.' And not just the real right stuff in the sense with him being a great pilot, which he was. But he was so much more than that. All his life, in whatever he did, Neil personified the essential qualities and core values of a superlative human being. Commitment, dedication, dependability, thirst for knowledge, self confidence, toughness, decisiveness, honesty, innovation, loyalty, positive attitude, self respect, respect for others, integrity, self reliance, prudence, judiciousness and the list goes on. No member of the human race

stepping out into and onto another heavenly body could possibly have represented the best of humanity better than Neil did. And no human being could've handled the bright glare of international fame or the instant transformation into a historic and cultural icon better than Neil. Sure, it was in Neil's mild and modest personality to avoid publicity and keep to the real business of the engineering profession that he had chosen, but he was simply not the sort of man to seek what he felt was undeserved profit from his name, from his reputation. In my studied analysis of the quiet and unassuming way that Neil lived his life after Apollo 11, and the way he avoided public attention, avoided the media, in all those subsequent years, I came to perceive that Neil possessed a special sensitivity that was part and parcel of his elemental character. It was as if he knew that what he had helped his country achieve in the summer of 1969, that epic landing of the first man on the moon and their safe return to Earth, would inexorably be diminished by the blatant commercialisms of our modern world."
(NASA/MSFC/Emmett Given)

Hansen, right, and his wife, Peggy Hansen, look at pictures on a large banner in the Building 4200 lobby documenting Armstrong's NASA career. "He had been at the top of the pyramid as the astronauts were, but there, as he constantly tried to explain, there had been nothing preordained in his becoming the commander of the first moon landing or becoming the first man out onto the lunar surface," Hansen told his Marshall audience. "As he always explained, it was mostly the luck of the draw [and] contingent circumstances. Still, he had done what he had done, and he understood what great sacrifice, what awesome commitment and what extraordinary creativity that it had taken to get it done. And he was immensely proud of the role he played in the first moon landing, no question."
(NASA/MSFC/Emmett Given)

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CFC 2012: 50 Volunteers Needed for Salvation Army Angel Tree Registration

Fifty volunteers are needed Sept. 24-28 to help with applicant registration for the Salvation Army's annual Angel Tree, which

provides Christmas assistance to qualifying children and seniors.

Five volunteers are needed per shift each day. Shifts are from 8:30 a.m. to 12:30 p.m., and 12:30 to 4:30 p.m. The Salvation Army is located at 2114 Oakwood Ave. in Huntsville. Click here to sign up.

The Angel Tree registration is the first opportunity to volunteer as part of the 2012 Combined Federal Campaign's Community Service Days. CFC is the government's annual goodwill drive to benefit charitable organizations. Community Service Days give Marshall Space Flight Center team members the chance to help those in need in the Huntsville area.

The Combined Federal Campaign officially launches Oct. 10. More information on the kickoff ceremony and additional volunteer opportunities will be posted on ExplorNet for Marshall team members in the coming weeks.

The Marshall Center's CFC effort is part of the Tennessee Valley Combined Federal Campaign -- a joint effort that also includes the Army's Aviation and Missile Command and other federal agencies at Redstone Arsenal and in surrounding Alabama and Tennessee counties.

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NASA Places Last Remaining External Tank, Et-94, Into Horizontal Position
NASA news release

On Sept. 15, NASA's Michoud Assembly Facility employees performed the final critical lift of the Space Shuttle's External Tank Program. External Tank 94, or ET-94, the last remaining assembled external tank from the Space Shuttle Program, was being stored inside Michoud's historic Vertical Assembly Building, known as the VAB. The facility's Manufacturing Support and Facility Operations Contract team lifted the large structure, which was standing in the vertical position, and gently placed it horizontally into its wheeled carrier.

Image right: External Tank 94 inside the Vehicle Assembly Building at the Michoud Assembly Facility. The Manufacturing Support and Facility Operations Contract team lifted the large structure, which was standing in the vertical position, and gently placed it horizontally into it's wheeled carrier Sept. 15. (NASA/MAF/Steven Seipel)

"It's a historic moment and the lift team performed flawlessly," said Robert Champion, NASA deputy director of Michoud. "This is the last external tank to leave our VAB, and while it marks the final critical lift of external tanks at the facility, it clears the way for the facility modifications needed to build the Space Launch System rocket."

Michoud's VAB stands 210 feet high and has served both the Apollo and Shuttle Programs. Construction crews are scheduled to begin modifying the VAB in late September to install new tools for manufacture of the core stage booster of the Space Launch System.

ET-94, a lightweight version of the external tank, measures approximately 154 feet long and 27.5 feet in diameter. Empty, the ET-94 weighs about 69,000 pounds, but once loaded with cryogenic fuel and oxidizer, tips the scales at about 1.6 million

pounds. The external tank served as the structural backbone of the space shuttle and was designed to absorb and distribute over 7 million pounds of thrust generated at launch. It also fed liquid oxygen and liquid hydrogen to the space shuttle main engines mounted on the shuttle's orbiter.

After the space shuttle Columbia accident, ET-94 was designated a test article for the program in order to validate processes and procedures prior to performing the work on a flight article. ET-94 was a vital part of NASA's ability to return flight and is a testament to the ingenuity and can-do spirit of the External Tank Team. ET-94 is being kept in a climate-controlled environment and monitored to preserve it for future testing or display.

The Michoud Assembly Facility, NASA's only large-scale manufacturing facility, is managed by the Marshall Space Flight Center and is currently operated by Jacobs Technology through the Manufacturing Support and Facility Operations Contract.

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Marshall Center Celebrates Innovation and Technology at Special Event
By Megan Davidson

More than 1,700 participants got an inside look at NASA and Marshall Space Flight Center programs and projects -- and some even had a conversation with Curiosity -- at Marshall's Innovation & Technology Day on Sept. 12.

Image left: Marshall Center Chief Technologist Andrew Keys welcomes guests as he officially kicks off the technology expo in Building 4316. (NASA/MSFC/Emmett Given)

"Innovation and technology are two crucial elements that drive all the great work we do here at Marshall," said Bobby Watkins, director of the Office of Strategic Analysis & Communications. He and Andrew Keys, Marshall's chief technologist, were event cosponsors. "We wanted people to come away from this with a better understanding of all the new programs and initiatives going on at the center that will further NASA's goals and missions."

This was the first year innovation was part of the annual event. Activities were held throughout the day, including a "Conversation with Curiosity," a video teleconferencing service with NASA's rover Curiosity project team members from NASA's Jet Propulsion Laboratory. Leading the discussion was Mars Exploration Rover Project Manager Peter C. Theisinger.

Image right: At the expo, Marshall Center team members watch a video highlighting NASA spaceflight and engineering capabilities in 3-D at Marshall's Mission Operations Laboratory booth. The video demonstrated the use of 3-D technology within NASA. (NASA/MSFC/Emmett Given)

"Curiosity is big news right now, so we were really excited to give Marshall team members an opportunity to ask questions and hear the latest updates on the project," said Burt Bright, moderator for the chat and an information technology specialist in Marshall's IT Strategy, Policy & Integration Office.

At Building 4316, a technology expo -- with more than 74 booths of interactive displays, exhibits and demonstrations -- showcased the latest trends and initiatives in the areas of information technology, engineering, science programs and projects. Also highlighted were services and products available to the Marshall and Redstone communities, such as cellphone plans. Participants got to see and do a variety of activities at the expo, from watching a video in 3-D to seeing how a rapid prototyping machine can quickly build scaled parts.

Image left: Angela Storey, left, a public affairs officer in the Office of Strategic Analysis & Communications, interviews engineer Jay Perry, right, who explains the Environmental Control and Life Support Systems, or ECLSS, work being conducted at the Marshall Center. ECLSS provides a safe and comfortable environment for the crew and ensures a pure supply of water and air on the International Space Station. The technology expo was broadcast live on Marshall TV. (NASA/MSFC/Emmett Given)

"The whole event was great. I heard time and time again, 'Wow, I didn't know Marshall did that. Thanks for bringing these capabilities to our attention,'" said Bright.

This also was one of the first events at Marshall to go mobile, providing an app for download with a schedule and event updates.

Image right: Technology expo participants check out more booths in one of the tents outside Building 4316. (NASA/MSFC/Emmett Given)

Innovation & Technology Day was hosted by Office of the Chief Information Officer and the Office of Strategic Analysis & Communications.

Davidson, an AI Signal Research Inc. employee, supports the Office of Strategic Analysis & Communications.

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HIRAD Set to Fly on Global Hawk Mission

By Janet Anderson

NASA has begun its latest hurricane study, called the Hurricane and Severe Storm Sentinel, or HS3, mission. For the first time, NASA will be flying two Global Hawks -- unmanned aerial vehicles -- over the U.S. East Coast to understand the processes which underlie hurricane formation and intensity change.

Image left: HIRAD arrives in the hanger for the HS3 mission. David Simmons, a scientist from the University of Alabama in Huntsville, is inspecting HIRAD before installation in the Global Hawk. (NASA)

The Hurricane Imaging Radiometer, or HIRAD, an instrument developed at the Marshall Space Flight Center, is scheduled to fly aboard the second Global Hawk. HIRAD will measure surface wind speeds and rain rates using its rectangular antenna to track activity on the ocean's surface. The antenna measures microwaves emitted by the ocean surface that are increased by the storm. As winds move across the surface of the sea, they generate white, frothy foam. This sea foam causes the ocean surface to emit increasingly large amounts of microwave radiation, similar in frequency or wavelength, but lower intensity, to that generated within a typical home microwave oven. HIRAD measures that microwave energy and, in doing so, allows scientists to deduce how powerfully the wind is blowing. With HIRAD's unique capabilities, the two-dimensional structure of the surface wind field can be much more accurately determined than current operational capabilities allow.

The Global Hawks can stay in the air for as long as 31 hours, and fly over hurricanes at altitudes greater than 60,000 feet. They are operated by pilots in ground control stations at Wallops Island, Va., and Dryden Flight Research Center. NASA has

been using these vehicles in field campaigns since 2010.

The first phase of the study began Sept. 11 and investigated the environment in and around Tropical Storm Nadine. Phase two initiates on the second Global Hawk on Sept. 26, and will look at the internal structure of developing and mature storms. Combined, the two aircraft use a unique set of instruments which measure wind, temperature, water vapor, precipitation and aerosols from the surface through the troposphere.

Using the information provided by HIRAD, along with other data collected by instruments in the field campaign, scientists can construct a more complete and detailed representation of the hurricane.

Image right: NASA will be flying two Global Hawks over the U.S. East Coast to understand the processes which underlie hurricane formation and intensity change. (NASA)

"We receive lots of pieces of information to figure out what's happening inside the storm," said Dr. Tim Miller, HIRAD principal investigator and atmospheric scientist at the Marshall Center. "We combine HIRAD's data with information from weather balloons, weather satellites and other aircraft instruments, we put it all together using a process called data assimilation, and we hope to better predict how a hurricane will behave."

This is the second field campaign in which HIRAD has participated. HIRAD was flown on NASA's WB-57 research aircraft during NASA's Genesis and Rapid Intensification Processes, or GRIP, experiment in 2010, which proved the concept of HIRAD's new technology.

The HS3 mission is an Earth Venture mission funded by NASA's Science Mission Directorate in Washington. Earth Venture missions are managed by NASA's Earth System Science Pathfinder Program at the Langley Research Center. The HS3 mission is managed by the Earth Science Project Office at Ames Research Center, and the principal investigator is from Goddard Space Flight Center.

For more information on the HS3 mission visit here.

Anderson is a public affairs officer in the Office of Strategic Analysis & Communications.

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NASA Hosts Third Annual 'International Observe the Moon Night'
By Shannon Ridinger

This Saturday, Sept. 22, from 5:30-8:30 p.m., Marshall Space Flight Center employees and the public will have the opportunity to celebrate "International Observe the Moon Night" at NASA's Education Training Facility at the U.S. Space & Rocket Center. Now in its third year, International Observe the Moon Night allows scientists, educators and moon enthusiasts from around the globe to gather together to learn more about the celestial body that humans first set foot on 43 years ago.

Image left: Last year, more than 580 International Observe the Moon Night events were held in 54 countries to bring a renewed interest to Earth's oldest celestial neighbor. (NASA/MSFC/Emmett Given)

With the recent passing of former astronaut Neil Armstrong, the first man to touch the moon's surface, returning to the moon and exploring farther into our solar system has once again become the topic of many conversations regarding human space exploration. Even though most of us will never get the opportunity to physically explore the moon or farther into our solar system, hands-on activities at International Observe the Moon Night will allow visitors to feel as if they are.

Participants will have the opportunity to take virtual 3-D trips to the moon in a specially equipped astronomy van, and see a magnified, command-module view of the lunar surface. Several telescopes will be available for viewing the moon, and an inflatable planetarium will offer shows that will allow visitors to discover more about the moon and planets. Individuals can also test their knowledge of the moon and solar system during a trivia game that will feature prizes to the winners.

Special speakers and presenters from the Marshall Center also will be on hand to discuss moon exploration and science, and answer questions from the public. These will include Dr. Barbara Cohen, a planetary scientist; Dr. Rob Suggs, head of Marshall's Space Environments Team; Dr. Renee Weber, a planetary scientist; Dr. Bill Cooke, lead of Marshall's Meteoroid Environments Office; and Rhiannon Blaauw, a meteor physicist.

For more on International Observe the Moon Night, click here.

Ridinger is a public affairs officer in the Office of Strategic Analysis & Communications.

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María Emma Torres, Daughter of Marshall Engineer, Receives Scholarship from NASA College Scholarship Fund

Marshall Space Flight Center Acting Center Director Robin Henderson, right, recently awarded María Emma Torres, second from right, with a scholarship from the NASA College Scholarship Fund. María Emma is the daughter of Marshall Space Flight Center materials engineer Pablo Torres, left, of the Engineering Directorate. Also attending the award presentation is María Emma's brother, Pablo Torres Jr., second from left, and her mother, María I. Torres, center. María Emma is a sophomore majoring in chemistry with an emphasis on biochemistry at the University of Alabama in Huntsville. She graduated valedictorian from East Limestone High School in 2011 at age 16. The NASA College Scholarship Fund Inc. -- a nonprofit organization managed by the Johnson Space Center -- awards scholarships agencywide to qualified NASA dependents pursuing studies in science and engineering fields. For more information, visit here.

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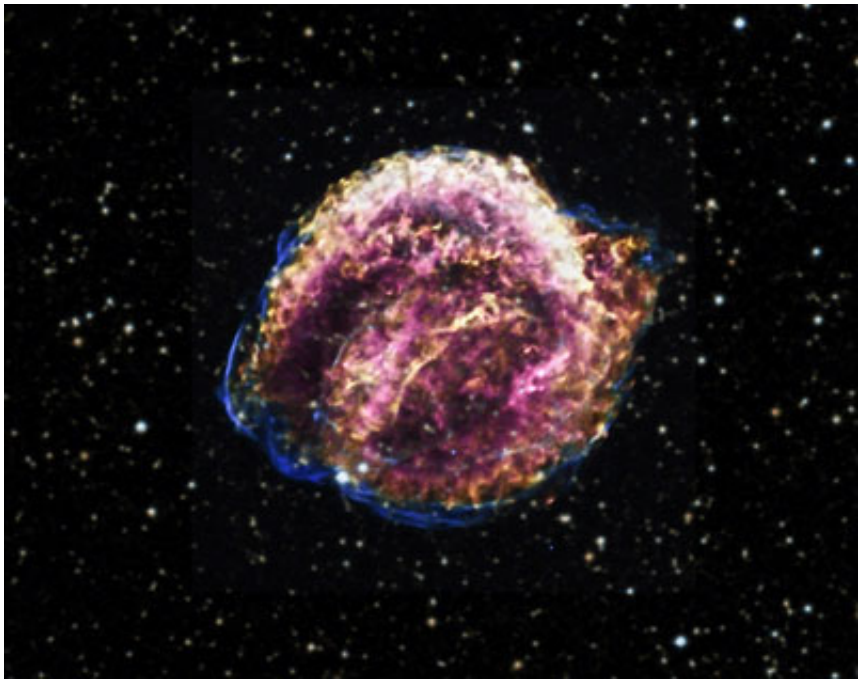
Was Kepler's Supernova Unusually Powerful?



In 1604, a new star appeared in the night sky that was much brighter than Jupiter and dimmed over several weeks. This event was witnessed by sky watchers including the famous astronomer Johannes Kepler. Centuries later, the debris from this exploded star is known as the Kepler supernova remnant. Astronomers have long studied the Kepler supernova remnant and tried to determine exactly what happened when the star exploded to create it. New analysis of a long observation from NASA's Chandra X-ray Observatory is providing more clues. This analysis suggests that the supernova explosion was not only more powerful, but might have also occurred at a greater distance than previously thought.

This image shows the Chandra data derived from more than eight days worth of observing time. The X-rays are shown in five colors from lower to higher energies: red, yellow, green, blue and purple. These various X-ray slices were then combined with an optical image from the Digitized Sky Survey, showing stars in the field.

Previous analysis of this Chandra image has determined that the stellar explosion that created Kepler was what astronomers call a "Type Ia" supernova. This class of supernovas occurs when a white dwarf gains mass, either by pulling gas off a companion star or merging with another white dwarf, until it becomes unstable and is destroyed by a

thermonuclear explosion.

Unlike other well-known Type Ia supernovas and their remnants, Kepler's debris field is being strongly shaped by what it is running into. More specifically, most Type Ia supernova remnants are very symmetrical, but the Kepler remnant is asymmetrical with a bright arc of X-ray emission in its northern region. This indicates the expanding ball of debris from the supernova explosion is plowing into the gas and dust around the now-dead star.

The bright X-ray arc can be explained in two ways. In one model, the pre-supernova star and its companion were moving through the interstellar gas and losing mass at a significant rate via a wind, creating a bow shock wave similar to that of a boat moving through water. Another possibility is that the X-ray arc is caused by debris from the supernova expanding into an interstellar cloud of gradually increasing density.

The wind and bow shock model described above requires that the Kepler supernova remnant is located at a distance of more than 23,000 light years. In the latter alternative, the gas into which the remnant is expanding has higher density than average, and the distance of the remnant from the Earth is between about 16,000 and 20,000 light years. Both alternatives give greater distances than the commonly used value of 13,000 light years.

In either model, the X-ray spectrum -- that is, the amount of X-rays produced at different energies -- reveals the presence of a large amount of iron, and indicates an explosion more energetic than the average Type Ia supernova. Additionally, to explain the observed X-ray spectrum in this model, a small cavity must have been cleared out around the star before it exploded. Such a cavity, which would have a diameter less than a tenth that of the remnant's current size, might have been produced by a fast, dense outflow from the surface of the white dwarf before it exploded, as predicted by some models of Type Ia supernovas.

Evidence for an unusually powerful Type Ia supernova has previously been observed in another remnant with Chandra and an optical telescope. These results were independently verified by subsequent observations of light from the original supernova explosion that bounced off gas clouds, a phenomenon called light echoes. This other remnant is located in the Large Magellanic Cloud, a small galaxy about 160,000 light years from Earth, making it much farther away than Kepler and therefore more difficult to study.

These results were published in the Sept. 1 edition of The Astrophysical Journal. The authors of this study are Daniel Patnaude from the Smithsonian Astrophysical Observatory in Cambridge, Mass.; Carles Badenes from University of Pittsburgh in Pittsburgh, Pa.; Sangwook Park from the University of Texas at Arlington; and Martin Laming from the Naval Research Laboratory in Washington.

The Marshall Space Flight Center manages the Chandra program for NASA's Science Mission Directorate in Washington. The Smithsonian Astrophysical Observatory controls Chandra's science and flight operations from Cambridge.

Credits: X-ray: NASA/CXC/SAO/D.Patnaude, Optical: DSS

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Expedition 32 Crew Lands Safely in Kazakhstan

Expedition 32 NASA Flight Engineer Joe Acaba signs the side of his Soyuz spacecraft shortly after he landed with his crewmates, Expedition 32 Commander Gennady Padalka and Flight Engineer Sergei Revin of Russia, in a remote area near the town of Arkalyk, Kazakhstan, on Sept. 16. They arrived at the International Space Station on May 17 and spent 125 days in space, 123 of which were aboard the orbiting laboratory. Acaba, Padalka and Revin orbited the Earth 2,000 times and traveled 52,906,428 miles. (NASA/Carla Cioffi)

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Marshall Team Encouraged to Take High Risk Conflict Resolution Training to Learn About Workplace Violence

A workplace violence prevention awareness class is now being offered at the Marshall Space Flight Center.

The High Risk Conflict Resolution Training is a four-hour, hands-on seminar where attendees will learn what to do in case they are faced with a critical incident of violence at work.

The class is designed for all Marshall team members, especially supervisors, managers and human resource specialists. Everyone is encouraged to attend.

"This is a great training opportunity in which all can benefit," said Diana Simpson, Marshall's workplace violence prevention program coordinator in the Protective Services Office. "Students will examine previous workplace violence incidents, learn the behavior of offenders, and practice verbal and physical tactics to survive a critical incident of violence in the workplace.

"Everyone wants to be safe in their work environment," she added. "The key to preventing a violent situation from occurring is 'Awareness+Action = Prevention.' This seminar will increase the students' knowledge on what actions to take before and/or during a dangerous event."

Morning or afternoon sessions will be in Building 4627 on Oct. 30, 8 a.m.-noon; Oct. 31, noon-4 p.m.; Nov. 1, noon-4 p.m.; and Nov. 2, 8 a.m.-noon.

It also includes voluntary physical skill drills and practical exercises to overcome conflicts in the office environment. Please wear clothing and footwear suitable for physical activity if you plan to participate.

Team members can sign up for the training through SATERN. For questions, contact Shawn Jayne, captain training coordinator, at 544-1961 or at shawn.d.jayne@nasa.gov.

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Marshall Team Members Can Help Meet Local Educational Needs with Federal Impact Aid Program

On Sept. 12, Huntsville-area schools and Redstone Arsenal kicked off their annual Federal Impact Aid program to provide federal grant money to purchase school supplies, computers and other items necessary for enhanced learning. Marshall Space Flight Center team members with school-age children can participate by taking a few minutes to fill out a Federal Impact Aid form.

The Federal Impact Aid program provides federal grant money to local school districts financially burdened or impacted by federal populations. These federal populations must live or work on federal property. The funding is used by local school districts to meet a variety of unfunded requirements, including the hiring of additional educators.

Over the past decade, local school system enrollments, including Arab City, Huntsville, Madison City, Madison County and Scottsboro, have increased by more than 6,500 students and those systems have received in excess of $8.9 million in Federal Impact Aid funds, according to Barbara Williams, the U.S. Army Garrison's education and school liaison officer at Redstone Arsenal.

Parents who do not receive a Federal Impact Aid form through their child's school can access a form here.

Find this article at:

http://www.nasa.gov/centers/marshall/about/star/index.html